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**Cai et al.**

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(54) **SYSTEM, METHOD AND APPARATUS FOR MODIFYING THE VISIBILITY PROPERTIES OF AN OBJECT**

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(58) **Field of Classification Search**  
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See application file for complete search history.

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(57) **ABSTRACT**

An object is disposed such that the apparatus is between the object and an observer. The appearance of the object is altered and, in the limit, the object cannot be observed, and the background appears unobstructed. The apparatus is formed of a metamaterial where the properties of the metamaterial are varied as a function of distance from the interfaces. The metamaterial may be fabricated as a composite material having a dielectric component and inclusions of particles of sub-wavelength size, and may also include a gain medium.

**12 Claims, 8 Drawing Sheets**

